201-16265

I U C L I D

Data Set

Existing Chemical	:	ID: 14643-87-9
CAS No.	:	14643-87-9
EINECS Name	:	zinc acrylate
EC No.	:	238-692-3
Molecular Formula	:	C3H4O2.1/2Zn

Producer related part

Company	:	ACC Specialty Acrylates and Methacrylates Panel
Creation date	:	27.10.2003

Substance related part

Company	:	ACC Specialty Acrylates and Methacrylates Panel
Creation date	:	27.10.2003
Status	:	
Memo	:	
Printing date	:	11.04.2006
Revision date	:	
Date of last update	:	26.05.2005
Number of pages	:	34
Chapter (profile)	:	Chapter: 1, 2, 3, 4, 5, 6, 7, 8, 10
Reliability (profile)	:	Reliability: without reliability, 1, 2, 3, 4
Flags (profile)	:	Flags: without flag, confidential, non confidential, WGK (DE), TA-Luft (DE), Material Safety Dataset, Risk Assessment, Directive 67/548/EEC, SIDS

1.0.1 APPLICANT AND COMPANY INFORMATION

1.0.2 LOCATION OF PRODUCTION SITE, IMPORTER OR FORMULATOR

1.0.3 IDENTITY OF RECIPIENTS

1.0.4 DETAILS ON CATEGORY/TEMPLATE

1.1.0 SUBSTANCE IDENTIFICATION

IUPAC Name	:	
Smiles Code	:	
Molecular formula	:	C6H4O4Zn (Undissociated Salt)
Molecular weight	:	207.50
Petrol class	:	

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1.1.1 GENERAL SUBSTANCE INFORMATION

Purity type	:	typical for marketed substance
Substance type	:	organometallic
Physical status	:	solid
Purity	:	= 100 % w/w
Colour	:	
Odour	:	

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1.1.2 SPECTRA

1.2 SYNONYMS AND TRADENAMES

2-Propenoic Acid, Zinc Salt

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Acrylic Acid, Zinc Salt

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Zinc Diacrylate

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1.3 IMPURITIES

1.4 ADDITIVES

1.5 TOTAL QUANTITY

1.6.1 LABELLING

1.6.2 CLASSIFICATION

1.6.3 PACKAGING

1.7 USE PATTERN

1.7.1 DETAILED USE PATTERN

1.7.2 METHODS OF MANUFACTURE

1.8 REGULATORY MEASURES

1.8.1 OCCUPATIONAL EXPOSURE LIMIT VALUES

1.8.2 ACCEPTABLE RESIDUES LEVELS

1.8.3 WATER POLLUTION

1.8.4 MAJOR ACCIDENT HAZARDS

1.8.5 AIR POLLUTION

1.8.6 LISTINGS E.G. CHEMICAL INVENTORIES

1.9.1 DEGRADATION/TRANSFORMATION PRODUCTS

1.9.2 COMPONENTS

1.10 SOURCE OF EXPOSURE

1.11 ADDITIONAL REMARKS

1.12 LAST LITERATURE SEARCH

1.13 REVIEWS

2.1 MELTING POINT

Sublimation	:	
Method	:	other: OPPTS Guideline 830.7200
Year	:	2003
GLP	:	yes
Test substance	:	other TS
Method	:	The capillary tube, filled with the test substance, was immersed in a silicone bath along with a thermometer, and the oil was gradually heated. The heating rate was initially set to approximately 3 K/minute and was adjusted to approximately 10 K below the expected melting point. The test sample was observed during the test for the different melting stages. The melting point determination was done in duplicate for the test substance and in triplicate for the instrument performance standards.
Result	:	When the test substance was heated, the first time there was no obvious change. Because of this, the test was repeated at individual temperatures for separate capillaries rather than heating one capillary over the entire range (60 to 300 degrees C). At about 235 to 240 degrees C, it was observed that the sample collapsed and changed from white to colorless. The sample never liquefied. Communication with the client indicated that the occurrence of this physical transition of zinc diacrylate at elevated temperatures was not uncommon. The phenomenon that was seen during testing occurs at 210 to 240 degrees C. The client further indicated that the most likely explanation for the observation during the melting point testing is that at a temperature above 210 degrees C there is a slight drop in the heat flow (which normally indicates the beginning of a melting point) but rather than proceeding to a liquid state, an exotherm occurs rapidly leading to homopolymerization. Therefore, there is not an observable melting point for zinc diacrylate due to homopolymerization.
Test substance	:	Zinc Diacrylate (SR111); CAS No. 14643-87-9; Lot No. 30715-6482; Purity = 100%.
Reliability	:	(1) valid without restriction
Flag	:	Critical study for SIDS endpoint

03.12.2003

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2.2 BOILING POINT

Value	:	= 141 °C at 1013 hPa
Decomposition	:	
Method	:	
Year	:	
GLP	:	
Test substance	:	other TS
Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(2) valid with restrictions
Flag	:	Critical study for SIDS endpoint

07.12.2003

(12)

2.3 DENSITY

2.3.1 GRANULOMETRY

2.4 VAPOUR PRESSURE

Value	:	= 3.8 hPa at 20 °C
Decomposition	:	
Method	:	
Year	:	
GLP	:	no
Test substance	:	other TS
Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(2) valid with restrictions
Flag	:	Critical study for SIDS endpoint

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2.5 PARTITION COEFFICIENT

Partition coefficient	:	
Log pow	:	= .46 at 25 °C
pH value	:	
Method	:	OECD Guide-line 107 "Partition Coefficient (n-octanol/water), Flask-shaking Method"
Year	:	
GLP	:	no
Test substance	:	other TS
Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(2) valid with restrictions
Flag	:	Critical study for SIDS endpoint

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Result : Miscible

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2.6.1 SOLUBILITY IN DIFFERENT MEDIA

Solubility in	:	Water
Value	:	at °C
pH value	:	= 5 - 6
concentration	:	25 g/l at 20.5 °C
Temperature effects	:	
Examine different pol.	:	
pKa	:	at 25 °C
Description	:	miscible
Stable	:	no
Deg. product	:	yes
Method	:	OECD Guide-line 105
Year	:	2004
GLP	:	yes
Test substance	:	other TS
Method	:	The results of the preliminary test specified in the OECD 105 guideline indicated a water solubilitiy in the 1 gram/liter range. Based on the results of the preliminary test, 25 grams of Zinc diacrylate/liter of water was tested

in the main study. The flask method was used for the determination of solubility. Three five-gram samples were weighed into flasks containing 200 ml of water, approximately 25 times the solubility of Zinc diacrylate in water, based on the results of the preliminary test. The flasks were stirred and incubated at 20 ± 0.5°C in a water bath until equilibrium was reached. A portion of each flask was sampled, filtered and analyzed at 24 hour intervals until the concentration of the vessels differed by less than 15%. The samples were first acidified followed by extraction into ether. The ether was dried with sodium sulfate and the extract was run by gas chromatography/mass spectroscopy (GC/MS)using a GC column suitable for free fatty acids.

Remark : At 24 hours after mixing, the amount of acrylic acid in the water reatched the theoretical maximum based on the amount added. This was confirmed at 48 horus. There was evidence of chemical instability of zinc diacrylate in water during the test. It dissociated rapidly and completely into acrylic acid and an insoluble zinc compound. The white precipitate was added to water and the water was analyzed for acrylic acid, but contained none. It is likely that the white precipitate is Zinc hydroxide. The following results were obtained for the concentration of acrylic acid in the water solutions:

Test Solution	Day 1 (mg/ml)	Day 2 (mg/ml)
1	29.14	30.10
2	28.31	31.06
3	29.09	
Average	28.8	30.58
RSD/RPD*	0.5 (RSD)	3.14 (RPD)

* = RSD: relative standard deviation,
RPD: relative percent difference

Test substance : Zinc diacrylate, CAS # 14643-87-9, Purity 100%. Lot # 40319-8700. White powder

Conclusion : Zinc diacrylate completely dissociates in water. As acrylic acid is similarly completely miscible with water at 20 ± 0.5°C with a solubility of 25 g/l, Zinc diacrylate is considered similarly miscible in water. The insoluble white precipitate is likely Zinc hydroxide

Reliability : (1) valid without restriction

Flag : Critical study for SIDS endpoint

26.05.2005

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2.6.2 SURFACE TENSION

2.7 FLASH POINT

2.8 AUTO FLAMMABILITY

2.9 FLAMMABILITY

2.10 EXPLOSIVE PROPERTIES

2.11 OXIDIZING PROPERTIES

2.12 DISSOCIATION CONSTANT

Acid-base constant	:	7.71
Method	:	other: OPPTS Guideline 830.7370
Year	:	2003
GLP	:	yes
Test substance	:	other TS
Method	:	The titration method was used for this study. Titrations were performed at 19 to 21 degrees C using the automated titrator. A sample as placed in a beaker, the beaker was then placed in a water bath and allowed to equilibrate to the test temperature. As the sample was titrated, the software program collected the volume added (in milliliters) and resulting pH. Titrations were conducted using sodium hydroxide (0.1 M) added in 0.020 ml equivalent increments. The pH of the test solution ranged from approximately 7.4 to approximately 8.0 during the titration with sodium hydroxide (0.1 M).
Result	:	The resulting titration curve from the titration of the 0.286 mg/ml zinc diacrylate solution with 0.1M hydrochloric acid was observed to be similar to the titration curve from the titration with C02-free water. It was concluded that there was no corresponding pKa value for the low range pH values. The pH of the test substance solutions was approximately 7.9 at the end of the pKa. The mean pKa for zinc diacrylate was determined to be 7.71 with astandard deviation of 0.0458. The temperature of all the test solutions remained within the acceptable range of 19 to 21 degrees C during all titrations.
Test substance	:	Zinc Diacrylate (SR111); CAS RN 14643-87-9; Lot No. 307156482; purity = 100%.
Reliability	:	(1) valid without restriction

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2.13 VISCOSITY

2.14 ADDITIONAL REMARKS

3.1.1 PHOTODEGRADATION

DIRECT PHOTOLYSIS

Halflife t1/2	:	= 13.2 hour(s)
Degradation	:	% after
Quantum yield	:	
Deg. product	:	
Method	:	other (calculated): EPIWIN (v 3.11) AOPWIN Submodel (v 1.91)
Year	:	2003
GLP	:	
Test substance	:	
Remark	:	Overall OH rate constant = 9.7250 E-12 cm3/molecule-sec The EPIWIN model was run using the following measured physical chemical properties: Log Kow (octanol-water) = 0.46; Vapor pressure (mm Hg) = 2.8; Boiling point (deg C) = 140.99; and Melting point (deg C) = 13.00.
Test substance	:	Acrylic acid; CAS RN 79-10-7
Reliability	:	(2) valid with restrictions
Flag	:	Critical study for SIDS endpoint

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3.1.2 STABILITY IN WATER

Type	:	abiotic
t1/2 pH4	:	at °C
t1/2 pH7	:	at °C
t1/2 pH9	:	at °C
t1/2 pH	:	> 28 day(s) at °C
Deg. product	:	
Method	:	
Year	:	1990
GLP	:	no data
Test substance	:	other TS
Remark	:	No hydrolysis at pH 3, 7 or 11 over 28 days. Not a standard method, but similar to OECD tests.
Test substance	:	Acrylic acid, CAS No. 79-10-7 AA purity > 98%
Reliability	:	(2) valid with restrictions
Flag	:	Critical study for SIDS endpoint

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3.1.3 STABILITY IN SOIL

3.2.1 MONITORING DATA

3.2.2 FIELD STUDIES

3.3.1 TRANSPORT BETWEEN ENVIRONMENTAL COMPARTMENTS

3.3.2 DISTRIBUTION

Media : other: air (emissions to compartment = 1000 kg/hr)
Method : Calculation according Mackay, Level III
Year : 2003

Remark : The EPIWIN model was run using the following measured physical chemical properties:
Vapor pressure (mm Hg) = 2.8;
Log Kow (octanol-water) = 0.46;
Boiling point (deg C) = 140.99; and
Melting point (deg C) = 13.00.

Result : Concentration (%):
Air - 33
Water - 18
Soil - 50
Sediment - <0.1

Level III Fugacity Model (Full-Output):
==========

Chem Name : 2-Propenoic acid
Molecular Wt: 72.06
Henry's LC : 3.7e-007 atm-m3/mole (Henry database)
Vapor Press : 2.8 mm Hg (user-entered)
Log Kow : 0.46 (user-entered)
Soil Koc : 1.18 (calc by model)

	Mass Amount (percent)	Half-Life (hr)	Emissions (kg/hr)
Air	32.6	22.6	1000
Water	17.5	208	0
Soil	49.9	208	0
Sediment	0.0267	832	0

	Fugacity (atm)	Reaction (kg/hr)	Advection (kg/hr)	Reaction (percent)	Advection (percent)
Air	7.05e-011	638	208	63.8	20.8
Water	2.86e-013	37.2	11.2	3.72	1.12
Soil	2.77e-011	106	0	10.6	0
Sediment	2.12e-013	0.0142	0.00034	0.00142	3.4e-005

Persistence Time: 63.8 hr
Reaction Time: 81.8 hr
Advection Time: 291 hr
Percent Reacted: 78.1
Percent Advected: 21.9

Half-Lives (hr), (based upon Biowin (Ultimate) and Aopwin):
Air: 22.6
Water: 208.1
Soil: 208.1
Sediment: 832.3
Biowin estimate: 3.405 (days-weeks)

Advection Times (hr):
Air: 100
Water: 1000

Sediment: 5e+004

Test substance : Acrylic acid; CAS RN 79-10-7
Reliability : (2) valid with restrictions
Flag : Critical study for SIDS endpoint
09.12.2003 (35)

Media : other: water (emissions to compartment = 1000 kg/hr)
Method : Calculation according Mackay, Level III
Year : 2003

Remark : The EPIWIN model was run using the following measured physical chemical properties:
Vapor pressure (mm Hg) = 2.8;
Log Kow (octanol-water) = 0.46;
Boiling point (deg C) = 140.99; and
Melting point (deg C) = 13.00.

Result : Concentration (%):
Air - <0.01
Water - 99.8
Soil - <0.1
Sediment - <1

Level III Fugacity Model (Full-Output):
==========

Chem Name : 2-Propenoic acid
Molecular Wt: 72.06
Henry's LC : 3.7e-007 atm-m3/mole (Henry database)
Vapor Press : 2.8 mm Hg (user-entered)
Log Kow : 0.46 (user-entered)
Soil Koc : 1.18 (calc by model)

	Mass Amount (percent)	Half-Life (hr)	Emissions (kg/hr)
Air	0.00785	22.6	0
Water	99.8	208	1000
Soil	0.012	208	0
Sediment	0.152	832	0

	Fugacity (atm)	Reaction (kg/hr)	Advection (kg/hr)	Reaction (percent)	Advection (percent)
Air	6.15e-014	0.556	0.181	0.0556	0.0181
Water	5.92e-012	768	231	76.8	23.1
Soil	2.41e-014	0.0925	0	0.00925	0
Sediment	4.39e-012	0.293	0.00704	0.0293	0.000704

Persistence Time: 231 hr
Reaction Time: 300 hr
Advection Time: 1e+003 hr
Percent Reacted: 76.9
Percent Advected: 23.1

Half-Lives (hr), (based upon Biowin (Ultimate) and Aopwin):
Air: 22.6
Water: 208.1
Soil: 208.1
Sediment: 832.3
Biowin estimate: 3.405 (days-weeks)

Advection Times (hr):
Air: 100
Water: 1000
Sediment: 5e+004

Test substance	:	Acrylic acid; CAS RN 79-10-7
Reliability	:	(2) valid with restrictions
Flag	:	Critical study for SIDS endpoint

11.12.2003 (35)

3.4 MODE OF DEGRADATION IN ACTUAL USE

3.5 BIODEGRADATION

Type	:	aerobic
Inoculum	:	other: activate sewage sludge bacteria
Concentration	:	3 mg/l related to Test substance related to
Contact time	:	
Degradation	:	= 81 (±) % after 28 day(s)
Result	:	readily biodegradable
Kinetic of testsubst.	:	5 day(s) = 56 % 15 day(s) = 64 % % % %
Deg. product	:	
Method	:	OECD Guide-line 301 D "Ready Biodegradability: Closed Bottle Test"
Year	:	1990
GLP	:	yes
Test substance	:	other TS

Remark	:	10 days-window fulfilled
Test substance	:	acrylic acid, CAS No. 79-10-7; purity > 99%
Reliability	:	(1) valid without restriction
Flag	:	Critical study for SIDS endpoint

10.12.2003 (14)

3.6 BOD5, COD OR BOD5/COD RATIO

3.7 BIOACCUMULATION

3.8 ADDITIONAL REMARKS

4.1 ACUTE/PROLONGED TOXICITY TO FISH

Type	:	flow through
Species	:	Salmo gairdneri (Fish, estuary, fresh water)
Exposure period	:	96 hour(s)
Unit	:	mg/l
NOEC	:	= 6.3
LC0	:	= 11
LC50	:	= 27
LC100	:	= 100
Limit test	:	
Analytical monitoring	:	yes
Method	:	OECD Guide-line 203 "Fish, Acute Toxicity Test"
Year	:	1990
GLP	:	yes
Test substance	:	other TS
Remark	:	The study also was conducted according to EPA OTS 797.1400. Twenty fish per test concentration plus a dilution water control were used in a nominal dosing regime of 6.5, 13, 25, 50 and 100 mg/l. Analytical measurements of Glacial Acrylic Acid were made at 0- and 96-hours. The measured concentrations averaged 6.3, 11, 23, 45 and 90 mg/l, respectively. A 96-hour LC50 was calculated to be 27 mg/l (21 and 33 mg/l). Mortality was observed in the 23, 45 and 90 mg/l test levels. Sublethal/behavioral responses (e.g. quiescence, fish on bottom of test vessel, loss of equilibrium and erratic swimming) were noted among the fish in the 11, 23, 45 and 90 mg/l test levels. As determined by this study, a 95-hour no-effect concentration of Glacial Acrylic Acid toxicity to rainbow trout was 6.3 mg/l based on a lack of sublethal responses at this concentration. pH at 11 mg/l: 7.2/7.3 at 23 mg/l: 6.9/7.0, at 45 mg/l: 6.3/6.4, at 90 mg/l: 4.7/4.8
Test substance	:	acrylic acid, CAS No. 79-10-7 Glacial acrylic acid, compound purity was given as 99.37%
Reliability	:	(1) valid without restriction
Flag	:	Critical study for SIDS endpoint

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4.2 ACUTE TOXICITY TO AQUATIC INVERTEBRATES

Type	:	
Species	:	Daphnia magna (Crustacea)
Exposure period	:	48 hour(s)
Unit	:	mg/l
EC0	:	= 35
EC50	:	= 47
EC100	:	= 100
Analytical monitoring	:	yes
Method	:	Directive 92/69/EEC, C.2
Year	:	1995

GLP	:	yes
Test substance	:	other TS
Remark	:	pH = 4.5 at the end of the test with 100 mg/l; 5.8 at 60 mg/l EC50 (24 h) = 50 mg/l
Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(1) valid without restriction
Flag	:	Critical study for SIDS endpoint

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4.3 TOXICITY TO AQUATIC PLANTS E.G. ALGAE

Species	:	Scenedesmus subspicatus (Algae)
Endpoint	:	biomass
Exposure period	:	72 hour(s)
Unit	:	mg/l
NOEC	:	= .008
LOEC	:	= .016
EC10	:	= .01
EC50	:	= .04
EC90	:	= .12
Limit test	:	
Analytical monitoring	:	yes
Method	:	other: EC Guideline 79/831/EEC, Annex V, C, 1988.
Year	:	1994
GLP	:	yes
Test substance	:	other TS
Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(1) valid without restriction
Flag	:	Critical study for SIDS endpoint

28.10.2003 (5)

4.4 TOXICITY TO MICROORGANISMS E.G. BACTERIA

4.5.1 CHRONIC TOXICITY TO FISH

4.5.2 CHRONIC TOXICITY TO AQUATIC INVERTEBRATES

Species	:	Daphnia magna (Crustacea)
Endpoint	:	other: maternal mortality
Exposure period	:	21 day(s)
Unit	:	mg/l
NOEC	:	= 7
Analytical monitoring	:	yes
Method	:	OECD Guide-line 202, part 2 "Daphnia sp., Reproduction Test"
Year	:	1995
GLP	:	yes
Test substance	:	other TS
Remark	:	The NOEC with respect to reproduction rate is 12 mg/l; LC100 = 20 mg/l.
Test condition	:	pH at 7 mg: 6.9 - 7.8 there may be a pH-effect at concentrations > 12 mg/l

semistatic test
Test substance : acrylic acid, CAS No. 79-10-7, purity 99.78%
Reliability : (1) valid without restriction
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4.6.1 TOXICITY TO SEDIMENT DWELLING ORGANISMS

4.6.2 TOXICITY TO TERRESTRIAL PLANTS

4.6.3 TOXICITY TO SOIL DWELLING ORGANISMS

4.6.4 TOX. TO OTHER NON MAMM. TERR. SPECIES

4.7 BIOLOGICAL EFFECTS MONITORING

4.8 BIOTRANSFORMATION AND KINETICS

4.9 ADDITIONAL REMARKS

5.0 TOXICOKINETICS, METABOLISM AND DISTRIBUTION

5.1.1 ACUTE ORAL TOXICITY

Type	:	LD50
Value	:	= 1337 mg/kg bw
Species	:	rat
Strain	:	
Sex	:	
Number of animals	:	
Vehicle	:	
Doses	:	
Method	:	other
Year	:	1974
GLP	:	no data
Test substance	:	other TS
Remark	:	5 male and 5 female rats/strain/dose level received undiluted acrylic acid (strains: CDF and Sprague-Dawley; doses: 31.6, 63, 126, 158, 316, 630, 1260, 1580, 2000, 2520, 5000 mg/kg). Mortalities were observed at a minimum dose of 63 mg/kg (3/9 female CDF rats died); 2000 mg/kg killed all test animals. Individual LD50 values for male and female CDF rats (approx. 140 mg/kg), for female Sprague-Dawley rats (approx. 1200 mg/kg), and for male Sprague-Dawley rats (approx. 1400 mg/kg) are computed. An overall oral LD50 for "rats" of 1337 mg/kg resulted (signs of toxicity: lethargy).
Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(2) valid with restrictions
Flag	:	Critical study for SIDS endpoint

28.10.2003 (15)

5.1.2 ACUTE INHALATION TOXICITY

Type	:	other: Acute vapor inhalation test
Value	:	
Species	:	rat
Strain	:	
Sex	:	
Number of animals	:	
Vehicle	:	
Doses	:	
Exposure time	:	1 hour(s)
Method	:	other: whole body exposure to vapor
Year	:	1988
GLP	:	no data
Test substance	:	other TS
Remark	:	5 male and 5 female rats/test were exposed to atmospheres of acrylic acid generated by static (1442 ppm and 1394 ppm; 4246 and 4105 mg/m3) or dynamic (bubbler, 2352 ppm; 6926 mg/m3) methods for 1 hour. The chamber acrylic acid concentration for all exposures was below saturated vapor concentration (4050 ppm), due to interaction of the water soluble test material and relative humidity of the air. No mortality was observed. On the day of exposure, signs of respiratory irritation, such as

perinasal wetness and encrustation and abdominal breathing were observed in all exposure groups. No pathologic changes were detected at necropsy after 2 weeks.

Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(1) valid without restriction

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5.1.3 ACUTE DERMAL TOXICITY

Type	:	LD50
Value	:	= 640 mg/kg bw
Species	:	rabbit
Strain	:	
Sex	:	
Number of animals	:	
Vehicle	:	
Doses	:	
Method	:	other
Year	:	1979
GLP	:	no
Test substance	:	other TS
Remark	:	5 male and 5 female rabbits/dose (doses: 400 and 640 mg/kg) were exposed to undiluted acrylic acid for 24 hours under occlusion.
Result	:	After application of 400 mg/kg 1/5 male and 1/5 female rabbits died on day 7 or later; after application of 640 mg/kg 2/5 male and 3/5 female rabbits died within 24 hours. Clinical signs: Local necroses, apathy, laboured respiration, poor general state. Necropsy: dilatated heart, lung edema.
Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(2) valid with restrictions
Flag	:	Critical study for SIDS endpoint

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5.1.4 ACUTE TOXICITY, OTHER ROUTES

5.2.1 SKIN IRRITATION

Species	:	rabbit
Concentration	:	undiluted
Exposure	:	Semiocclusive
Exposure time	:	4 hour(s)
Number of animals	:	6
Vehicle	:	
PDII	:	.13
Result	:	not irritating
Classification	:	
Method	:	other: TSCA 40 CFR 798.4470
Year	:	1991
GLP	:	yes
Test substance	:	other TS
Remark	:	Six female New Zealand Albino rabbits (2.1 to 2.3 kg) were used on study. Approximately 24 hours prior to application the dorsal trunk of each animal

was clipped free of hair. The undiluted test substance (0.5 ml) was applied to the clipped trunk of each animal and a gauze patch and semi-occlusive dressing was placed over the application area and secured with non-irritating tape. After 4 hours of exposure, the semi-occlusive dressing was removed and any residual test substance was removed with water. Animals were observed for skin reactions at 30 to 60 minutes after removal of the dressing and again at 24, 48 and 72 hours post-exposure. Erythema and edema were scored according to the numerical Draize technique. The skin also was evaluated for ulceration and necrosis or any evidence of tissue destruction. Body weights were recorded pretest and the general health of each animal was monitored at each observation period.

Result : The test substance was practically non-irritating to the skin. Only slight edema was observed in 3 of 6 rabbits immediately following patch removal. No other signs of irritation were observed at any other time interval. The PDII was 0.125. The following table provides the mean erythema and edema scores for each observation interval:

Observation Interval (hr)	Erythema	Edema
0.5 - 1	0	0.5
24	0	0
48	0	0
72	0	0

Test substance : Zinc Acrylate + additives: SR 633, Lot #22
No additional information provided.

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5.2.2 EYE IRRITATION

Species : rabbit
Concentration :
Dose : .1 ml
Exposure time :
Comment : not rinsed
Number of animals : 1
Vehicle : none
Result : corrosive
Classification : irritating
Method : OECD Guide-line 405 "Acute Eye Irritation/Corrosion"
Year : 1993
GLP : yes
Test substance : other TS

Remark : One New Zealand Albino rabbit (3.2 kg) was used in the study. Twenty-four hours prior to test article instillation, the eye to be used for treatment was anesthetized with Ophthaine Solution. On the day of treatment, the test article was instilled into the conjunctival sac of the anesthetized eye. After instillation, the lid was held together for approximately one second to insure adequate distribution of the test article into the one. One eye was dosed and the contralateral eye served as the control. The treated eye was examined and scored by the Draize technique for irritation of the cornea, iris and conjunctiva at 1 hour post dose and on days 1, 2, 3 and 7. Body weights were recorded pretest and the general health of the animal was monitored at each observation interval.

Result : There were no abnormal physical signs noted during the observation period. Corneal opacity and conjunctival redness, chemosis and discharge were observed at 1 hour post-instillation and persisted through day 7. Iritis was observed at day 1 and also persisted through day 7. The test article appears to be corrosive to the rabbit eye.

Test substance : Zinc Acrylate: SR-111

No additional information provided.

10.12.2003 (30)

5.3 SENSITIZATION

5.4 REPEATED DOSE TOXICITY

Type	:	
Species	:	rat
Sex	:	male/female
Strain	:	Wistar
Route of admin.	:	drinking water
Exposure period	:	3 months; 12 months
Frequency of treatm.	:	daily
Post exposure period	:	
Doses	:	6, 40, 100, 210 mg/kg bw/day males; 10, 66, 150, 375 mg/kg bw/day females (120, 800, 2000 and 5000 ppm)
Control group	:	yes
NOAEL	:	= 40 - 66 mg/kg
Method	:	OECD Guide-line 408 "Subchronic Oral Toxicity - Rodent: 90-day Study"
Year	:	1993
GLP	:	yes
Test substance	:	other TS
Result	:	One male rat of the 120-ppm group died at day 326 of the study. This animal showed a marked increase in drinking water consumption and anaemic appearance before death. Water intake was significantly reduced in male rats of the 5000-ppm groups and slightly reduced in female rats of the 5000-ppm groups as well as in rats of both sexes of the 2000-ppm groups. A reduced food consumption was seen in male rats of the 5000-ppm groups. The body weight gain was reduced in male rats of the 5000-ppm groups and slightly reduced in male rats of the 2000-ppm dosages. NOAEL after 3-months and 12-months exposure to acrylic acid with drinking water was 40 mg/kg bw/d in males and 66 mg/kg bw/d in females.
Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(1) valid without restriction
Flag	:	Critical study for SIDS endpoint

07.12.2003 (2) (17)

Type	:	
Species	:	rat
Sex	:	male/female
Strain	:	Fischer 344
Route of admin.	:	drinking water
Exposure period	:	3 months
Frequency of treatm.	:	daily
Post exposure period	:	
Doses	:	83, 250, 750 mg/kg bw/day
Control group	:	yes
NOAEL	:	= 83 mg/kg bw
Method	:	other: no data
Year	:	1984
GLP	:	no data
Test substance	:	other TS

Result	:	No deaths were reported during the study. Reduced food consumption was observed in high dose animals of both sexes. There was a dose-related reduction in water intake for all male rats and for females in the high and intermediate dose groups in comparison with the controls. Body weight gain was depressed markedly in animals of both sexes in the high dose groups, slightly reduced in males of the intermediate dose group and significantly reduced in females of the intermediate dose group at the end of the study. An increase in serum urea nitrogen was noted for male rats at the high dosage. In female rats in the high dose group, parameters of clinical chemistry were altered: decreased serum cholesterol levels, increased serum urea nitrogen, glucose, alkaline phosphatase and aspartate transaminase levels. In addition, dose-related increases of serum urea nitrogen and alkaline phosphatase and a decrease in serum cholesterol were observed in female rats of the intermediate dose group. In animals of both sexes at the high and intermediate dose groups, increases of urine specific gravity and urine protein were observed. A decrease in urine pH was noted in female rats of the high dose group. In animals of both sexes of the high and intermediate dose groups, absolute mean weights of liver, spleen and heart were significantly decreased. Additionally absolute brain weights in high dosage males were reduced. Male rats of the high dose group showed significantly increased relative weights of liver, kidney, spleen, brain and testes; male rats of the intermediate dosage showed significant dose-related increase in relative kidney and testes weights. Female rats of the high and intermediate dose groups showed significant dose-related increases in absolute and relative kidney weights and increased relative brain weights. No treatment-related gross lesions nor histo-pathological findings were noted. Reduced water consumption may be due to a bad palatability of the test substance. Reduced water consumption alone is known to result in a number of effects including increased kidney weights and altered urine parameters (ACC SAM Panel). The NOAEL was considered to be 83 mg/kg bw/day.
Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(1) valid without restriction
Flag	:	Critical study for SIDS endpoint
07.12.2003		(13) (23) (24)
Type	:	
Species	:	rat
Sex	:	male/female
Strain	:	Fischer 344
Route of admin.	:	inhalation
Exposure period	:	13 weeks
Frequency of treatm.	:	6 hours/day, 5 days/week
Post exposure period	:	
Doses	:	5, 25, 75 ppm (0.015, 0.074, 0.221 mg/l)
Control group	:	yes
NOAEL	:	= 25 - ppm
Method	:	other: similar to OECD 413
Year	:	1979
GLP	:	yes
Test substance	:	other TS
Result	:	No mortality was observed during the study. There were no discernible changes in appearence or behavior.

Clinical chemistry analysis and urinalysis parameters were not statistically different from controls. There were no effects on organ weights or organ-to-body weight ratios. There were no gross pathologic observations in rats which were considered to be related to treatment with the test substance. Histopathologic examinations revealed lesions of the nasal mucosa in 7/10 male and 10/10 female rats in the 75-ppm group. The nasal lesions in affected rats of the 75-ppm group consisted of slight focal degeneration of the olfactory epithelium on the dorsomedial aspect of the nasal passages. The NOAEL in rats was 25 ppm (0.074 mg/l).

Test substance : acrylic acid, CAS No. 79-10-7
Reliability : (1) valid without restriction
Flag : Critical study for SIDS endpoint
07.12.2003 (16) (28) (29) (33)

Type :
Species : mouse
Sex : male/female
Strain : B6C3F1
Route of admin. : inhalation
Exposure period : 13 weeks
Frequency of treatm. : 6 h/d, 5 d/week
Post exposure period :
Doses : 5, 25, 75 ppm (0.015; 0.074; 0.221 mg/l)
Control group : yes
Method : OECD Guide-line 413 "Subchronic Inhalation Toxicity: 90-day Study"
Year : 1979
GLP : yes
Test substance : other TS

Result : A male mouse each in the 75-ppm group and in the 25-ppm group died during the study period, apparently as a result of trauma incurred while handling. An additional female mouse in the 75-ppm group was killed in a moribund condition after 5-6 weeks of exposure. There were no discernible changes in appearence or behavior of the mice. Female mice of the 25- and 75-ppm groups showed significantly lower mean body weight gains than controls. Hematologic analysis revealed in male mice of the 25-ppm and 75-ppm group and in female mice of the 75-ppm group a slight decrease of the mean hemoglobin concentration. Clinical chemistry analysis and urinalysis parameters were not statistically different from controls. There were no effects on organ weights or organ-to-body weight ratios of mice. There were no gross pathologic observations in mice which were considered to be related to treatment with the test substance. Lesions of the olfactory portion of the nasal mucosa were detected in all males and females in the 75-ppm group, as well as in all males and 9/10 females in the 25-ppm group, and in 1/10 males and 4/10 females in the 5-ppm group. The lesions in the 75-ppm group consisted of: focal degeneration of the olfactory epithelium with partial replacement by an epithelium resembling respiratory epithelium; very slight focal infiltration of mononuclear inflammatory cells in the mucosa and submucosa; and very slight focal hyperplasia of the submucosal glands within some of the affected areas. No NOAEL in mice was determined.

Test substance : acrylic acid, CAS No. 79-10-7
Reliability : (1) valid without restriction
Flag : Critical study for SIDS endpoint

07.12.2003 (16) (28) (29) (33)

5.5 GENETIC TOXICITY 'IN VITRO'

Type	:	Bacterial gene mutation assay
System of testing	:	Salmonella typhimurium TA 98, TA 100, TA 1535, TA 1537, TA 1538
Test concentration	:	0.1 - 500 ug/plate
Cycotoxic concentr.	:	
Metabolic activation	:	with and without
Result	:	negative
Method	:	other:
Year	:	1977
GLP	:	no
Test substance	:	other TS

Method : Ames et al., Mutation Research 31:347, 1975.

Remark : The plate test consisted of direct revertant colony counts obtained from a set of selective agar plates seeded with populations of mutant cells suspended in a semisolid overlay. Approximately 10^8 cells were treated with the test substance in the presence and absence of a metabolic activation system (Aroclor 1254-treated rat liver supernatant). The plates were incubated for 48 hours at 37 °C, and scored for the number of colonies growing on each plate.

Solvent and Positive Controls: Dimethylsulfoxide (DMSO) was the solvent for the test substance and served as the solvent control. For the non-activation assay, the following positive control substances were used: Methylnitrosoguanidine (for strains TA1535, TA100 and D4); 2-Nitrofluorene (for strains TA1538 and TA98); and quinacrine mustard (for strain TA1537). The positive control substances, 2-anthramine (for strains TA1535, TA100), 2-acetylaminofluorene (strains TA1538 and TA98) and 8-aminoquinoline (TA1537) were used for the specified tester strains with metabolic activation. The positive control substance used for D4 without activation was not identified in the report.

Criteria for evaluating results: The solvent control values must be within the normal historical control range and the presence of a dose response is required for establishing mutagenicity. For strains TA1535, TA1537 and TA1538, if the solvent control value is within the normal range, a test substance producing a positive response over three concentrations with the lowest increase equal to twice the solvent control is considered mutagenic. For strains TA98, TA100 and D4, a test substance producing a positive response over three concentrations with the lowest increase equal to twice the solvent control (TA100) or two to three times the solvent control (TA98 and D4) is considered mutagenic. In addition, a positive response must be repeated in a separate assay.

Plates/test: 1

Activation system: S9 liver homogenate prepared from Aroclor 1254-induced male Sprague-Dawley rats.

Result : The test substance did not exhibit mutagenic activity in any of the assays conducted in this evaluation and was considered not mutagenic under these test conditions according to the evaluation criteria.

The following table provides the data for the number of revertants per plate without metabolic activation:

Dose (µg/plate)	TA1535	TA1537	TA1538	TA98	TA100	D4
Solvent (DMSO)	16	13	19	28	84	93

0.1	12	15	19	20	59	94
1.0	13	12	11	31	84	99
10	18	12	20	32	73	72
100	10	16	10	21	70	43
500	7	9	11	22	58	40
Positive Control	>1000	>1000	>1000	>1000	>1000	>1000

The following table provides the data for the number of revertants per plate with metabolic activation:

Dose (µg/plate)	TA1535	TA1537	TA1538	TA98	TA100	D4
Solvent (DMSO)	15	19	25	37	123	86
0.1	18	20	28	36	123	89
1.0	15	19	20	34	114	91
10	19	16	25	26	118	81
100	15	19	16	27	54	55
500	14	11	24	21	68	40
Positive Control	288	235	>1000	>1000	>1000	124

Test substance : Zinc Acrylate: X-111 Lot 503
No other information provided.
Reliability : (2) valid with restrictions
Flag : Critical study for SIDS endpoint
11.12.2003 (25)

Type : Bacterial gene mutation assay
System of testing : Salmonella typhimurium TA 98, TA 100, TA 1535, TA 1537
Test concentration : 33 - 5000 ug/plate
Cycotoxic concentr. :
Metabolic activation : with and without
Result : negative
Method : OECD Guide-line 471
Year : 1991
GLP : no data
Test substance : other TS

Remark : Cytotoxic effects for doses of 1000 ug/plate and higher
Test substance : acrylic acid, CAS No. 79-10-7
Reliability : (2) valid with restrictions
Flag : Critical study for SIDS endpoint
10.12.2003 (9)

Type : Cytogenetic assay
System of testing : in vitro chromosomal aberration test with CHO cells
Test concentration : without S-9 mix, up to 5000 nl/ml; with S-9 mix, up to 2800 nl/ml
Cycotoxic concentr. :
Metabolic activation : with and without
Result : positive
Method : OECD Guide-line 473
Year : 1992
GLP : no data
Test substance : other TS

Remark : Cytotoxicity without S-9 mix, 42% relative survival at 5000 nl/ml; with S-9-mix, 35% relative survival at 2846 nl/ml.
Test substance : acrylic acid, CAS No. 79-10-7
Reliability : (2) valid with restrictions
Flag : Critical study for SIDS endpoint
10.12.2003 (27)

Type : Mammalian cell gene mutation assay
System of testing : HPRT with CHO cells

Test concentration	:	without S-9 mix, 0.3 - 1.9 µl/ml; with S-9 mix, 1.0 - 2.4 µl/ml
Cycotoxic concentr.	:	
Metabolic activation	:	with and without
Result	:	negative
Method	:	OECD Guide-line 476
Year	:	1992
GLP	:	no data
Test substance	:	other TS
Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(2) valid with restrictions
30.10.2003		(27)

Type	:	Mammalian cell gene mutation assay
System of testing	:	Mouse lymphoma assay
Test concentration	:	without S-9 mix, 1.62 - 5.44 mmol/l; with S-9 mix 4.41 - 26.5 mmol/l
Cycotoxic concentr.	:	
Metabolic activation	:	with and without
Result	:	positive
Method	:	OECD Guide-line 476
Year	:	1991
GLP	:	no data
Test substance	:	other TS
Remark	:	Cytotoxicity without S-9 mix, 15% relative growth (rtg) at 4.56 mmol/l; 20% rtg at 22.1 mmol/l
Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(2) valid with restrictions
10.11.2003		(9)

Type	:	Unscheduled DNA synthesis
System of testing	:	Primary rat hepatocytes
Test concentration	:	0.01 to 0.40 µl/ml (10.5 to 420 µg/ml)
Cycotoxic concentr.	:	
Metabolic activation	:	without
Result	:	negative
Method	:	OECD Guide-line 482
Year	:	1992
GLP	:	no data
Test substance	:	other TS
Remark	:	Total toxicity at higher doses.
Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(2) valid with restrictions
30.10.2003		(27)

5.6 GENETIC TOXICITY 'IN VIVO'

5.7 CARCINOGENICITY

5.8.1 TOXICITY TO FERTILITY

Type	:	Two generation study
Species	:	rat
Sex	:	male/female
Strain	:	Wistar
Route of admin.	:	drinking water

Exposure period	:	premating, mating, gestation, lactation
Frequency of treatm.	:	continously
Premating exposure period		
Male	:	at least 70 days (for both F0 and F1 generation)
Female	:	at least 70 days (for both F0 and F1 generation)
Duration of test	:	353 days (ca. 11.5 months)
No. of generation studies	:	
Doses	:	500; 2500 and 5000 ppm (approximately 53; 240 and 460 mg/kg body weight/day)
Control group	:	yes, concurrent vehicle
Method	:	OECD Guide-line 416 "Two-generation Reproduction Toxicity Study"
Year	:	1983
GLP	:	yes
Test substance	:	other TS
Remark	:	Each dose group consisted of 25 males and 25 females; each male was mated to one female.
Result	:	Parental generations: no substance-related effects on fertility and reproductive performance in parental animals at doses of up to 5000 ppm; general systemic toxicity was apparent with reduced body weights, food and water consumption in F0 parental animals at 5000 ppm and in F1 parental animals at 5000 and 2500 ppm; the only treatment-related pathological finding was a minimal hyperkeratosis of the limiting ridge in the fore-stomach with a minimal edema of the submucosa of the glandular stomach in both parental generations at 5000 ppm. Offspring generations: dose-related signs of developmental toxicity in F1 and F2 pups at 5000 and 2500 ppm in form of retarded growth (reduced body weight gain) and some delay in the eye/auditory canal opening in F2 pups; no evidence of adverse influence on pup morphology; the NOAEL from this study for reproductive performance and fertility is 5000 ppm.
Test substance	:	acrylic acid, CAS No. 79-10-7
Reliability	:	(1) valid without restriction
Flag	:	Critical study for SIDS endpoint

10.11.2003 (3) (18)

5.8.2 DEVELOPMENTAL TOXICITY/TERATOGENICITY

Species	:	rat
Sex	:	female
Strain	:	Sprague-Dawley
Route of admin.	:	inhalation
Exposure period	:	days 6 to 15 of gestation
Frequency of treatm.	:	6 h/day
Duration of test	:	until day 20 of gestation
Doses	:	40; 120; 360 ppm, (0.12; 0.360; 1.08 mg/l) acrylic acid vapor
Control group	:	yes
Method	:	OECD Guide-line 414 "Teratogenicity"
Year	:	1981
GLP	:	yes
Test substance	:	other TS
Remark	:	In the main investigation each dose group consisted of 25 to 27 pregnant animals; in an additional pretest to the main study 5 animals per group had been used for exposure to

vapor concentration levels of 225 and 450 ppm, however, no assessment of embryonic or fetal toxicity had been performed.

Result : Maternal toxicity occurred in animals exposed to 225 and 450 ppm in the pretest (reduced food intake and body weight gain, sensory irritations); at 360 ppm in the main study maternal toxicity consisted of sensory irriatation (discharge from the eyes, snout wiping, restless behavior) with statistically significant reductions in body weight, body weight gain and food consumption relative to that of chamber controls; effects on body weight and body weight gain were dose-related and when corrected for uterus weight were statistically significant in animals exposed to 120 ppm, with an effect on body weight gain also at 40 ppm; there were no signs of group-related trens or significant differences between groups in terms of numbers of implantation losses, live fetuses, or resorptions; also there were no group-related differences in the incidences of abnormalities, variations, or retardations in the fetuses in terms of general appearance and the conditions of the internal organs or the skeletons;
the NOAEL maternal toxicity from this study is <40 ppm;
the NOAEL embryo-fetotoxicity from this study is 360 ppm.

Test substance : acrylic acid, CAS No. 79-10-7
Reliability : (2) valid with restrictions
Flag : Critical study for SIDS endpoint
07.12.2003 (26)

Species : rabbit
Sex : female
Strain : New Zealand white
Route of admin. : inhalation
Exposure period : days 6 to 18 of gestation
Frequency of treatm. : 6 h/day
Duration of test : until day 29 of gestation
Doses : 25; 75; 225 ppm (0.075; 0.225; 0.675 mg/l)
Control group : yes
Method : OECD Guide-line 414 "Teratogenicity"
Year : 1981
GLP : yes
Test substance : other TS

Remark : In a range-finding study preceding to the main study, 8 animals per group were used for exposure to vapor concentration levels of 30, 60, 125 and 250 ppm; these animals were exposed during g.d. 10-22; three animals per group were sacrificed on the day following the last exposure (g.d. 23), and the remaining animals were killed and necropsied on g.d. 29; from the range-finding study no assessment of embryonic or fetal toxicity was performed; in the main investigation each dose group consisted of 15 to 16 pregnant animals.

Result : Maternal toxicity occurred in animals exposed to more than 60 ppm in terms of concentration-related reductions in food consumption and body weight gain; at concentration of >75 ppm sensory irritation was observed including perinasal and perioral wetness and severe nasal congestion; occasional color changes and ulcerations in the nasal turbinates were determined in the 60 and 225 ppm groups; histological evaluation of the nasal turbinates revealed lesions in the nasal epithelium; there were no signs of developmental toxicity including teratogenicity, based on the lack of an effect on the number of ovarian corpora lutea, and the total viable or non-viable (early and late resorptions and dead fetuses) implantations/litter; percentage of live fetuses, sex ratio and fetal body weights were equivalent across groups; there were no exposure-related increases in the incidences

of external, visceral or skeletal malformations; the NOAEL maternal toxicity from this study is 25 ppm; the NOAEL embryo-/fetotoxicity from this study is 225 ppm.

Test substance : acrylic acid, CAS No. 79-10-7
Reliability : (1) valid without restriction
Flag : Critical study for SIDS endpoint
11.12.2003 (31) (37)

5.8.3 TOXICITY TO REPRODUCTION, OTHER STUDIES

5.9 SPECIFIC INVESTIGATIONS

5.10 EXPOSURE EXPERIENCE

5.11 ADDITIONAL REMARKS

6.1 ANALYTICAL METHODS

6.2 DETECTION AND IDENTIFICATION

7.1 FUNCTION

7.2 EFFECTS ON ORGANISMS TO BE CONTROLLED

7.3 ORGANISMS TO BE PROTECTED

7.4 USER

7.5 RESISTANCE

8.1 METHODS HANDLING AND STORING

8.2 FIRE GUIDANCE

8.3 EMERGENCY MEASURES

8.4 POSSIB. OF RENDERING SUBST. HARMLESS

8.5 WASTE MANAGEMENT

8.6 SIDE-EFFECTS DETECTION

8.7 SUBSTANCE REGISTERED AS DANGEROUS FOR GROUND WATER

8.8 REACTIVITY TOWARDS CONTAINER MATERIAL

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10.1 END POINT SUMMARY

10.2 HAZARD SUMMARY

10.3 RISK ASSESSMENT